Attorney's Docket No. 9209-2 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: El-Fekih et al. Examiner: Nittaya Juntima
Serial No. 09/932,739 Group Art Unit: 2616
Filed: August 17, 2001 Confirmation No.: 4591
For: **METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR MANAGING A SERVICE PROVIDED BY A NETWORK**

Date: December 18, 2006

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TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION--37 C.F.R. § 41.37)

1. Transmitted herewith is the APPEAL BRIEF for the above-identified application, pursuant to the Notice of Appeal filed on October 12, 2006 and received in the U. S. Patent and Trademark Office October 16, 2006.

2. This application is filed on behalf of
☐ a small entity.

3. Pursuant to 37 C.F.R. § 41.20(b)(2), the fee for filing the Appeal Brief is:
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Myers Bigel Sibley & Sajovec, P.A.
P. O. Box 37428
Raleigh, North Carolina 27627
Telephone: (919) 854-1400
Facsimile: (919) 854-1401
Customer No. 20792

Respectfully submitted,

D. Scott Moore
Registration No.: 42,011

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Amelia Tauchen

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Amelia Tauchen

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. §41.37

Sir:

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed October 12, 2006 and received in the U. S. Patent and Trademark Office October 16, 2006.

Real Party In Interest

The real party in interest is assignee Trendium, Inc., Sunrise, Florida.

Related Appeals and Interferences

Appellants are aware of no appeals or interferences that would be affected by the present appeal.

Status of Claims

Appellants appeal the rejection of Claims 1, 3 - 7, 9, 11, 12, 14, 16 - 18, 20, 21, 23, 24, 46, 48 - 52, 54, 56, 57, 59, 61 - 63, 65, 66, 68, 69, 91, 93 - 97, 99, 101, 102, 104, 106 - 108, 110, 111, 113, and 114, and the objection to Claims 8, 10, 13, 15, 19, 22, 25, 26 - 34, 53, 55, 58, 60, 64, 67, 70 - 79, 98, 100, 103, 105, 109, 112, and 115 - 124. Claims 2, 35 - 45, 47, 80 - 90, 92, and 125 - 135 have been canceled. Appellants submit that the claims involved in the appeal are independent Claims 1, 46, and 91 and the rejected dependent Claims 3 - 7, 9, 11, 12, 14, 16 - 18, 20, 21, 23, 24, 48 - 52, 54, 56, 57, 59, 61 - 63, 65, 66, 68, 69, 93 - 97, 99, 101, 102, 104, 106 - 108, 110, 111, 113, and 114, and the objected to dependent Claims 8, 10, 13, 15, 19, 22, 25, 26 - 34, 53, 55, 58, 60, 64, 67, 70 - 79, 98, 100, 103, 105, 109, 112, and 115 - 124 as a reversal of the rejection of independent Claims 1, 46, and 91 is requested in the present appeal and a reversal of the rejection of dependent Claims 3 - 7, 9, 11, 12, 14, 16 - 18, 20, 21, 23, 24, 48 - 52, 54, 56, 57, 59, 61 - 63, 65, 66, 68, 69, 93 - 97, 99, 101, 102, 104, 106 - 108, 110, 111, 113, and 114, and a reversal of the objection to dependent Claims 8, 10, 13, 15, 19, 22, 25, 26 - 34, 53, 55, 58, 60, 64, 67, 70 - 79, 98, 100, 103, 105, 109, 112, and 115 - 124 is also requested based on the reversal of the rejection of the independent claims. Accordingly, the pending claims as included in Appellants' response to the Office Action of January 24, 2006 are attached hereto as Appendix A.

Status of Amendments

No responses after final rejection have been filed in the present case.

Summary of Claimed Subject Matter

Independent Claim 1 is directed to a method of managing a service in which service quality requirements are obtained from a client (Specification page 20, lines 2 - 5; FIG. 7, block 172) and quality data are collected from a network (Specification page 20, lines 5 - 7; FIG. 7, block 174) that comprises a plurality of network elements (FIG. 1, network 22). The quality data are collected by querying one or more access network elements for the quality data (Specification, page 20, lines 8 - 10; FIG. 8, block 176). The one or more access network elements are configured at an edge of the network and provide access to the network (FIG. 1,

access elements 34a - 34f). The quality data are saved in a repository (Specification page 20, lines 12 - 15; FIG. 8, block 178) and the quality data are analyzed (Specification page 20, lines 16 - 18; FIG. 8, block 182). The analyzed quality data are saved in the repository (Specification page 20, lines 18 - 20; FIG. 8, block 184). The collected quality data are compared with service quality requirements to determine if the service quality requirements are satisfied (Specification page 20, lines 21 - 23; FIG. 7, block 186).

Independent Claim 46 is directed to a system for managing a service that includes means for obtaining service quality requirements from a client (Specification page 20, lines 2 - 5; FIG. 7, block 172) and means for collecting quality data from a network (Specification page 20, lines 5 - 7; FIG. 7, block 174) that comprises a plurality of network elements (FIG. 1, network 22). The means for collecting quality data comprises means for querying at least one access network element for the quality data. (Specification, page 20, lines 8 - 10; FIG. 8, block 176). The at least one access network element is one of those network elements of the plurality of network elements that are configured at an edge of the network and provide access to the network. (FIG. 1, access elements 34a - 34f). The means for collecting quality data further comprises means for saving the quality data in a repository (Specification page 20, lines 12 - 15; FIG. 8, block 178), means for analyzing the quality data (Specification page 20, lines 18 - 20; FIG. 8, block 184), and means for saving the analyzed quality data in the repository (Specification page 20, lines 18 - 20; FIG. 8, block 184). The system further comprises means for comparing the collected quality data with the service quality requirements to determine if the service quality requirements are satisfied. (Specification page 20, lines 21 - 23; FIG. 7, block 186). (See, also, Specification page 19, lines 8 - 30). The processor 82 and memory 84 provide structure for all of the means recitations of independent Claim 46.

Independent Claim 91 is directed to a computer program product for managing a service, comprising a computer readable storage medium (FIG. 3, memory 84) having computer readable program code embodied therein (FIG. 3, mediation facilities 88), the computer readable program code comprising computer readable program code for obtaining service quality requirements from a client (Specification page 20, lines 2 - 5; FIG. 7, block 172) and computer readable program code for collecting quality data from a network (Specification page 20, lines 5 - 7; FIG. 7, block 174) that

comprises a plurality of network elements (FIG. 1, network 22). The computer readable program code for collecting quality data comprises computer readable program code for querying at least one access network element for the quality data. (Specification, page 20, lines 8 - 10; FIG. 8, block 176). The at least one access network element is one of those network elements of the plurality of network elements that are configured at an edge of the network and provide access to the network. (FIG. 1, access elements 34a - 34f). The computer readable program code for collecting quality data comprises further comprises computer readable program code for saving the quality data in a repository (Specification page 20, lines 12 - 15; FIG. 8, block 178), computer readable program code for analyzing the quality data (Specification page 20, lines 18 - 20; FIG. 8, block 184), and computer readable program code for saving the analyzed quality data in the repository (Specification page 20, lines 18 - 20; FIG. 8, block 184). The computer program product for managing a service further comprises comparing the collected quality data with the service quality requirements to determine if the service quality requirements are satisfied. (Specification page 20, lines 21 - 23; FIG. 7, block 186).

Ground of Rejection to be Reviewed on Appeal

Claims 1, 46, and 91 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 6,748,433 to Yaakov (hereinafter "Yaakov") in view of U. S. Patent No. 6,405,250 to Lin et al. (hereinafter "Lin").

Claims 9, 11-12, 14, 54, 56-57, 59, 99, 101-102, and 104 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yaakov in view of Lin and further in view of U. S. Patent No. 5,898,673 to Riggan (hereinafter "Riggan").

Claims 18, 63, and 108 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yaakov in view of Lin and further in view of Riggan and U. S. Patent No. 6,545,979 to Poulin (hereinafter "Poulin").

Argument

I. Introduction to 35 U.S.C. §103 Analysis

A determination under §103 that an invention would have been obvious to someone of ordinary skill in the art is a conclusion of law based on fact. *Panduit Corp. v. Dennison Mfg. Co.* 810 F.2d 1593, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987), *cert. denied*, 107 S.Ct. 2187. After the involved facts are determined, the decision maker must then make the legal determination of whether the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time the invention was unknown, and just before it was made. *Id.* at 1596. The United States Patent and Trademark Office (USPTO) has the initial burden under §103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

To establish a prima facie case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. M.P.E.P. §2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. §2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be **clear and particular**, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In another decision, the Court of Appeals for the Federal Circuit has stated that, to support combining or modifying references, there must be **particular** evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

Appellants respectfully submit that the pending independent claims are patentable over the cited references for at least the reason that neither of the cited references includes any

particular evidence that would motivate one skilled in the art to combine their respective teachings.

A. Claims 1, 46, and 91 are Patentable

Independent Claims 1, 46, and 91 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yaakov in view of Lin.

Independent Claim 1 is directed to a method of managing a service and recites in part:

> obtaining service quality requirements from a client;
> collecting quality data from a network that comprises a plurality of network elements, comprising:
> querying at least one access network element for the quality data, the at least one access network element is one of those network elements of the plurality of network elements that are configured at an edge of the network and provide access to the network;
> saving the quality data in a repository;
> analyzing the quality data; and
> saving the analyzed quality data in the repository; and
> comparing the collected quality data with the service quality requirements to determine if the service quality requirements are satisfied.

Independent Claims 46 and 91 include similar recitations. Thus, according to the recitations of the pending independent claims, at least one network element is queried for the quality data *and* the at least one network element is configured at an edge of the network and provides access to the network.

The Final Office Action of July 12, 2006 (hereinafter "Final Action") acknowledges that "...Yaakov fails to teach querying the access network element for the quality data," but alleges that Lin provides the missing teaching. (Final Action page 4). Appellants respectfully submit, however, that neither Yaakov nor Lin includes any motivation or suggestion to modify Yaakov as indicated in the Final Action.

To establish a prima facie case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

teachings. M.P.E.P. §2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. §2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be **clear and particular**, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In another decision, the Court of Appeals for the Federal Circuit has stated that, to support combining or modifying references, there must be **particular** evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

As affirmed by the Court of Appeals for the Federal Circuit in *In re Sang-su Lee*, a factual question of motivation is material to patentability, **and cannot be resolved on subjective belief and unknown authority**. *See In re Sang-su Lee*, 277 F.3d 1338 (Fed. Cir. 2002). It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."

Yaakov describes the use of Remote Test Units 20 for obtaining quality data from the network edge at col. 7, lines 16 - 23 as follows:

> To this purpose, at least two opposite access units 16 are provided with Remote Test Units (RTU) 20 for **intrusive** quality monitoring which are switched in the access lines and are capable of obtaining particular quality parameters from messages of a particular call transmitted there-between over the network (to be more exact, the parameters are determined by comparison transmitted signals to the received ones). (Emphasis Added)

Thus, according to Yaakov, Remote Test Units are inserted at the network edge to obtain quality data in an intrusive manner. Yaakov describes the use of non-intrusive Monitoring Systems (MS) 22 for collecting quality data; however, the non-intrusive Monitoring Systems 22 are not used as the network edge, but are instead used within the signaling/trunking network as shown in FIGS. 1 and 2. (Yaakov, col. 7, lines 24 - 30 and col. 7, line 66 - col. 8, line 2).

By contrast, Lin describes the collection of status information from a network element in a passive, non-intrusive manner. For example, Lin states:

> In order for NMS 120 to gather status information from NE's 101-104, each NE must either report to NMS 120 voluntarily or response to a request from NMS 120; there is no way for NMS 120 to 'passively observe' the behavior of an NE without the cooperation of the NE. In other words, as part of its design, an NE must report a selected set of status information upon triggering of some internal or external events. (Lin, col. 6, lines 12 - 19).

Appellants respectfully submit that one skilled in the art would not be motivated to combine the intrusive data collection design of Yaakov with the passive, non-intrusive design of Lin as such a combination would appear to be duplicative in that both Yaakov's Remote Test Units 20 and the network elements on the network edge would be tasked with collecting quality data. Such an approach would involve increased expense due to the addition of the Remote Test Units 20 and increased complexity in determining what data is collected via the Remote Test Units 20 and what data is collected at the network elements on the network edge.

In response to the foregoing argument, the Final Action asserts that the passage reproduced above from Lin teaches an intrusive data collection design. (Final Action, page 13). Appellants respectfully disagree. As shown in FIG. 1 of Yaakov, the RTU 20 is configured for intrusive quality monitoring because it is placed in series in the communication path defined by the access lines of the access unit 16. In sharp contrast, Lin describes the NMS 120 as collecting status information from NEs in response to queries. The NMS 120 is not configured in series in the communication path to intrusively collect status information. Because Yaakov's and Lin's designs are fundamentally different, their combination would be duplicative as discussed above, resulting in increased expense and complexity. Appellants, therefore, maintain that there is no disclosure or suggestion in either Yaakov or Lin that would motivate one skilled in the art to combine their teachings. It appears that the Final Action gains its alleged impetus or suggestion to combine the cited references by hindsight reasoning informed by Appellants' disclosure, which, as noted above, is an inappropriate basis for combining references.

For at least the foregoing reasons, Appellants submit independent Claims 1, 46, and 91 are patentable over the cited references and that rejected dependent Claims 3 - 7, 9, 11, 12, 14,

16 - 18, 20, 21, 23, 24, 48 - 52, 54, 56, 57, 59, 61 - 63, 65, 66, 68, 69, 93 - 97, 99, 101, 102, 104, 106 - 108, 110, 111, 113, and 114 and the objected to dependent Claims 8, 10, 13, 15, 19, 22, 25, 26 - 34, 53, 55, 58, 60, 64, 67, 70 - 79, 98, 100, 103, 105, 109, 112, and 115 - 124 are patentable, at least, by virtue of their depending from an allowable claim. Accordingly, Appellants respectfully request that the rejection of Claims 1, 3 - 7, 9, 11, 12, 14, 16 - 18, 20, 21, 23, 24, 46, 48 - 52, 54, 56, 57, 59, 61 - 63, 65, 66, 68, 69, 91, 93 - 97, 99, 101, 102, 104, 106 - 108, 110, 111, 113, and 114 and the objection to Claims 8, 10, 13, 15, 19, 22, 25, 26 - 34, 53, 55, 58, 60, 64, 67, 70 - 79, 98, 100, 103, 105, 109, 112, and 115 - 124 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons.

B. Claims 9, 11-12, 14, 54, 56-57, 59, 99, 101-102, and 104 are Patentable

Dependent Claims 9, 11-12, 14, 54, 56-57, 59, 99, 101-102, and 104 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yaakov in view of Lin and further in view of Riggan. Dependent Claims 9, 11-12, 14, 54, 56-57, 59, 99, 101-102, and 104 each depend from one of the independent Claims 1, 46, and 91 which Appellants submit are patentable for at least the reasons discussed above in Section IA. Appellants submit that dependent Claims 9, 11-12, 14, 54, 56-57, 59, 99, 101-102, and 104 are patentable over the cited references at least by virtue of their depending an allowable claim. *Ex parte Ligh*, 159 U.S.P.Q. (BNA) 61, 62 (Bd. App. 1967). Accordingly, Appellants respectfully request that the rejection of Claims 9, 11-12, 14, 54, 56-57, 59, 99, 101-102, and 104 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons.

C. Claims 18, 63, and 108 are Patentable

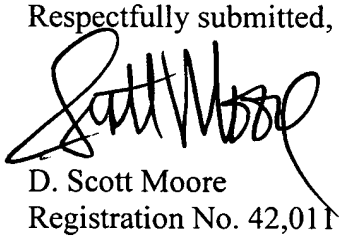
Dependent Claims 18, 63, and 108 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yaakov in view of Lin and further in view of Rigganand Poulin. Dependent Claims 18, 63, and 108 each depend from one of the independent Claims 1, 46, and 91 which Appellants submit are patentable for at least the reasons discussed above in Section IA. Appellants submit that dependent Claims 18, 63, and 108 are patentable over the cited references at least by virtue of their depending an allowable claim. *Ex parte Ligh*, 159 U.S.P.Q. (BNA) 61,

62 (Bd. App. 1967). Accordingly, Appellants respectfully request that the rejection of Claims 18, 63, and 108 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons.

II. Conclusion

In summary, Appellants respectfully submit that the independent Claims 1, 46, and 91 are patentable over the cited references for at least the reason that the combination of the cited references is improper. Accordingly, Appellants respectfully request reversal of the rejection of independent Claims 1, 46, and 91 and all pending claims depending therefrom.

Respectfully submitted,



D. Scott Moore
Registration No. 42,011

Myers Bigel Sibley & Sajovec, P.A.
P. O. Box 37428
Raleigh, North Carolina 27627
Telephone: (919) 854-1400
Facsimile: (919) 854-1401
Customer No. 20792

APPENDIX A

1. (Previously presented) A method of managing a service, comprising the steps of:

obtaining service quality requirements from a client;

collecting quality data from a network that comprises a plurality of network elements, comprising:

querying at least one access network element for the quality data, the at least one access network element is one of those network elements of the plurality of network elements that are configured at an edge of the network and provide access to the network;

saving the quality data in a repository;

analyzing the quality data; and

saving the analyzed quality data in the repository; and

comparing the collected quality data with the service quality requirements to determine if the service quality requirements are satisfied.

3. (Previously presented) A method as recited in Claim 1, where the step of querying the at least one access network element for the quality data comprises the step of:

querying at least one of the at least one access network element and a data collection agency for the quality data.

4. (Previously presented) A method as recited in Claim 1, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the step of analyzing the quality data comprises the step of:

computing an availability measure for at least one of the VPN, the at least one VC, and the at least one NI.

5. (Original) A method as recited in Claim 4, wherein the availability measure of the VPN is based on the availability measure of the at least one VC.

6. (Original) A method as recited in Claim 4, wherein the step of analyzing the quality data further comprises the steps of:

computing a mean time to restore (MTTR) measure for the at least one of the VPN, the at least one VC, and the at least one NI; and

computing a mean time between service outages (MTBSO) measure for the at least one of the VPN, the at least one VC, and the at least one NI.

7. (Original) A method as recited in Claim 6, wherein the MTTR measure of the VPN and the MTBSO measure of the VPN are based on the MTTR measure of the at least one VC and the MTBSO measure of the at least one VC, respectively.

8. (Original) A method as recited in Claim 6, further comprising the steps of:

receiving a service availability report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

sending the requested service availability report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested service availability report comprising at least one of the availability measure, the MTTR measure, and the MTSBO measure for the at least one of the VPN, the at least one VC, and the at least one NI.

9. (Original) A method as recited in Claim 6, further comprising the steps of:

associating an availability threshold with at least one of the VPN, the at least one VC, and the at least one NI; and

comparing the availability measure for the at least one of the VPN, the at least one VC, and the at least one NI with the respectively associated availability threshold.

10. (Original) A method as recited in Claim 9, further comprising the steps of:

receiving a service availability report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

sending the requested service availability report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested service availability report comprising at least one of the availability measure, the MTTR measure, and the MTSBO measure for the at least one of the VPN, the at least one VC, and the at least one NI and a comparison of the availability measure for the at least one of the VPN, the at least one VC, and the at least one NI with the availability threshold that is associated with the at least one of the VPN, the at least one VC, and the at least one NI.

11. (Previously presented) A method as recited in Claim 1, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the step of analyzing the quality data comprises the step of:

computing a bandwidth utilization measure for at least one of the VPN, the at least one VC, and the at least one NI.

12. (Original) A method as recited in Claim 11, wherein the bandwidth utilization measure of the VPN is based on the bandwidth utilization measure of the at least one VC.

13. (Original) A method as recited in Claim 11, further comprising the steps of:

receiving a bandwidth utilization report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

sending the requested bandwidth utilization report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested bandwidth utilization report comprising the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI.

14. (Original) A method as recited in Claim 11, further comprising the steps of:

associating an over utilization threshold and an under utilization threshold with the at least one of the VPN, the at least one VC, and the at least one NI; and

comparing the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI with the respectively associated over utilization threshold and under utilization threshold.

15. (Original) A method as recited in Claim 14, further comprising the steps of:

receiving a bandwidth utilization report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

sending the requested bandwidth utilization report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested bandwidth utilization report comprising the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI and a comparison of the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI with the over utilization threshold and under utilization threshold that are associated with the at least one of the VPN, the at least one VC, and the at least one NI.

16. (Previously presented) A method as recited in Claim 1, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the step of analyzing the quality data comprises the step of:

computing a delay measure for at least one of the VPN, the at least one VC, and the at least one NI.

17. (Original) A method as recited in Claim 16, wherein the delay measure of the VPN is based on the delay measure of the at least one VC.

18. (Original) A method as recited in Claim 16, wherein the step of computing the delay measure for the at least one of the VPN, the at least one VC, and the at least one NI comprises the steps of:

computing a cell delay variation (CDV) measure for the at least one of the VPN, the at least one VC, and the at least one NI; and

computing a round trip transfer delay (RTTD) measure for the at least one of the VPN, the at least one VC, and the at least one NI.

19. (Original) A method as recited in Claim 18, further comprising the steps of:

receiving a delay report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

sending the requested delay report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested delay report comprising at least one of the CDV measure and the RTTD measure for the at least one of the VPN, the at least one VC, and the at least one NI.

20. (Previously presented) A method as recited in Claim 1, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the step of analyzing the quality data comprises the step of:

computing an error measure for the at least one VC.

21. (Original) A method as recited in Claim 20, wherein the step of computing the error measure for the at least one VC comprises the steps of:

determining at least one of a number of lost cells, a number of misinserted cells, a number of discarded cells, a number of errored cells, and a number of cells that violate the service quality requirements from the client for the at least one VC; and

computing at least one of a cell loss ratio (CLR), a cell error ratio (CER), and a severely errored cell block ratio (SECBR) for the at least one VC.

22. (Original) A method as recited in Claim 21, further comprising the steps of:

receiving an error report request from the client for the at least one VC; and

sending the requested error report to the client for the at least one VC, the requested error report comprising at least one of the number of lost cells, the number of misinserted cells, the number of discarded cells, the number of errored cells, the number of cells that violate the service quality requirements from the client, the CLR, the CER, and the SECBR for the at least one VC.

23. (Previously presented) A method as recited in Claim 1, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the step of analyzing the quality data comprises the step of:

computing a fault measure for at least one of the VPN, the at least one VC, and the at least one NI.

24. (Original) A method as recited in Claim 23, wherein the step of computing the fault measure for the at least one of the VPN, the at least one VC, and the at least one NI comprises the step of:

determining at least one of a number of errored seconds (ES), a number of severely errored seconds (SES), and a number of unavailable seconds (UAS) for the at least one of the VPN, the at least one VC, and the at least one NI.

25. (Original) A method as recited in Claim 24, further comprising the steps of:

receiving a fault report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

sending the requested fault report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested fault report comprising at least one of the number of errored seconds (ES), the number of severely errored seconds (SES), and the number of unavailable seconds (UAS) for the at least one of the VPN, the at least one VC, and the at least one NI.

26. (Previously presented) A method as recited in Claim 1, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the step of analyzing the quality data comprises the steps of:

defining a plurality of quality parameters for at least one of the VPN, the at least one VC, and the at least one NI;

obtaining a plurality of configured values, a respective one of which being associated with a respective one of the plurality of quality parameters;

computing a plurality of quality measures, a respective one of which being associated with the respective one of the plurality of quality parameters and the respective one of the plurality of configured values;

comparing the respective one of the plurality of quality measures with the respective one of the plurality of configured values to determine a plurality of differences therebetween;

computing a plurality of numerical grades, a respective one of which being based on a respective one of the plurality of differences; and

summing the plurality of numerical grades to determine a quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

27. (Original) A method as recited in Claim 26, further comprising the step of:

defining a plurality of threshold ranges, a respective one of which being associated with the respective one of the plurality of quality parameters and the respective one of the plurality of configured values; and

comparing the respective one of the plurality of differences with the respective one of the plurality of threshold ranges.

28. (Original) A method as recited in Claim 27, wherein the step of computing the plurality of numerical grades, the respective one of which being based on the respective one of the plurality of differences comprises the step of:

computing the plurality of numerical grades, the respective one of which being based on the comparison of the respective one of the plurality of differences with the respective one of the plurality of threshold ranges.

29. (Original) A method as recited in Claim 26, further comprising the steps of:

obtaining a plurality of weight coefficients, a respective one of which being associated with the respective one of the plurality of quality parameters; and

multiplying the respective one of the plurality of numerical grades by the respective one of the plurality of weight coefficients prior to the step of summing the plurality of numerical grades to determine the quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

30. (Original) A method as recited in Claim 26, wherein the plurality of weight coefficients are obtained from the client.

31. (Original) A method as recited in Claim 26, further comprising the step of:

determining a qualitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI based on the quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

32. (Original) A method as recited in Claim 26, wherein the quantitative quality appraisal of the VPN is based on the quantitative quality appraisal of the at least one VC.

33. (Original) A method as recited in Claim 26, wherein the plurality of configured values are obtained from the client.

34. (Original) A method as recited in Claim 26, wherein the plurality of quality parameters are associated with an ATM quality of service class selected from the group of service classes consisting of a constant bit rate (CBR) class, a real time variable bit rate (RT-

VBR) class, a non-real time variable bit rate (NRT-VBR) class, an unspecified bit rate (UBR) class, and an available bit rate (ABR) class.

46. (Previously presented) A system for managing a service, comprising:

means for obtaining service quality requirements from a client;

means for collecting quality data from a network that comprises a plurality of network elements, the means for collecting quality data comprising:

means for querying at least one access network element for the quality data, the at least one access network element is one of those network elements of the plurality of network elements that are configured at an edge of the network and provide access to the network;

means for saving the quality data in a repository;

means for analyzing the quality data; and

means for saving the analyzed quality data in the repository; and

means for comparing the collected quality data with the service quality requirements to determine if the service quality requirements are satisfied.

48. (Previously presented) A system as recited in Claim 46, where the means for querying the at least one access network element for the quality data comprises:

means for querying at least one of the at least one access network element and a data collection agency for the quality data.

49. (Previously presented) A system as recited in Claim 46, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the means for analyzing the quality data comprises:

means for computing an availability measure for at least one of the VPN, the at least one VC, and the at least one NI.

50. (Original) A system as recited in Claim 49, wherein the availability measure of the VPN is based on the availability measure of the at least one VC.

51. (Original) A system as recited in Claim 49, wherein the means for analyzing the quality data further comprises:

means for computing a mean time to restore (MTTR) measure for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for computing a mean time between service outages (MTBSO) measure for the at least one of the VPN, the at least one VC, and the at least one NI.

52. (Original) A system as recited in Claim 51, wherein the MTTR measure of the VPN and the MTBSO measure of the VPN are based on the MTTR measure of the at least one VC and the MTBSO measure of the at least one VC, respectively.

53. (Original) A system as recited in Claim 51, further comprising:

means for receiving a service availability report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for sending the requested service availability report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested service availability report comprising at least one of the availability measure, the MTTR measure, and the MTSBO measure for the at least one of the VPN, the at least one VC, and the at least one NI.

54. (Original) A system as recited in Claim 51, further comprising:

means for associating an availability threshold with at least one of the VPN, the at least one VC, and the at least one NI; and

means for comparing the availability measure for the at least one of the VPN, the at least one VC, and the at least one NI with the respectively associated availability threshold.

55. (Original) A system as recited in Claim 54, further comprising:

means for receiving a service availability report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for sending the requested service availability report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested service availability report comprising at least one of the availability measure, the MTTR measure, and the MTSBO measure for the at least one of the VPN, the at least one VC, and the at least one NI and a comparison of the availability measure for the at least one of the VPN, the at least one VC, and the at least one NI with the availability threshold that is associated with the at least one of the VPN, the at least one VC, and the at least one NI.

56. (Previously presented) A system as recited in Claim 46, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the means for analyzing the quality data comprises:

means for computing a bandwidth utilization measure for at least one of the VPN, the at least one VC, and the at least one NI.

57. (Original) A system as recited in Claim 56, wherein the bandwidth utilization measure of the VPN is based on the bandwidth utilization measure of the at least one VC.

58. (Original) A system as recited in Claim 56, further comprising:

means for receiving a bandwidth utilization report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for sending the requested bandwidth utilization report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested bandwidth utilization report comprising the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI.

59. (Original) A system as recited in Claim 56, further comprising:

means for associating an over utilization threshold and an under utilization threshold with the at least one of the VPN, the at least one VC, and the at least one NI; and

means for comparing the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI with the respectively associated over utilization threshold and under utilization threshold.

60. (Original) A system as recited in Claim 59, further comprising:

means for receiving a bandwidth utilization report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for sending the requested bandwidth utilization report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested bandwidth utilization report comprising the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI and a comparison of the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI with the over utilization threshold and under utilization threshold that are associated with the at least one of the VPN, the at least one VC, and the at least one NI.

61. (Previously presented) A system as recited in Claim 46, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the means for analyzing the quality data comprises:

means for computing a delay measure for at least one of the VPN, the at least one VC, and the at least one NI.

62. (Original) A system as recited in Claim 61, wherein the delay measure of the VPN is based on the delay measure of the at least one VC.

63. (Original) A system as recited in Claim 61, wherein the means for computing the delay measure for the at least one of the VPN, the at least one VC, and the at least one NI comprises:

means for computing a cell delay variation (CDV) measure for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for computing a round trip transfer delay (RTTD) measure for the at least one of the VPN, the at least one VC, and the at least one NI.

64. (Original) A system as recited in Claim 63, further comprising:

means for receiving a delay report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for sending the requested delay report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested delay report comprising at least one of the CDV measure and the RTTD measure for the at least one of the VPN, the at least one VC, and the at least one NI.

65. (Previously presented) A system as recited in Claim 46, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the means for analyzing the quality data comprises:

means for computing an error measure for the at least one VC.

66. (Original) A system as recited in Claim 65, wherein the means for computing the error measure for the at least one VC comprises:

means for determining at least one of a number of lost cells, a number of misinserted cells, a number of discarded cells, a number of errored cells, and a number of cells that violate the service quality requirements from the client for the at least one VC; and

means for computing at least one of a cell loss ratio (CLR), a cell error ratio (CER), and a severely errored cell block ratio (SECBR) for the at least one VC.

67. (Original) A system as recited in Claim 66, further comprising:

means for receiving an error report request from the client for the at least one VC; and

means for sending the requested error report to the client for the at least one VC, the requested error report comprising at least one of the number of lost cells, the number of misinserted cells, the number of discarded cells, the number of errored cells, the number of cells that violate the service quality requirements from the client, the CLR, the CER, and the SECBR for the at least one VC.

68. (Previously presented) A system as recited in Claim 46, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the means for analyzing the quality data comprises:

means for computing a fault measure for at least one of the VPN, the at least one VC, and the at least one NI.

69. (Original) A system as recited in Claim 68, wherein the means for computing the fault measure for the at least one of the VPN, the at least one VC, and the at least one NI comprises:

means for determining at least one of a number of errored seconds (ES), a number of severely errored seconds (SES), and a number of unavailable seconds (UAS) for the at least one of the VPN, the at least one VC, and the at least one NI.

70. (Original) A system as recited in Claim 69, further comprising:

means for receiving a fault report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

means for sending the requested fault report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested fault report comprising at least one of the number of errored seconds (ES), the number of severely errored seconds (SES), and the

number of unavailable seconds (UAS) for the at least one of the VPN, the at least one VC, and the at least one NI.

71. (Previously presented) A system as recited in Claim 46, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the means for analyzing the quality data comprises:

means for defining a plurality of quality parameters for at least one of the VPN, the at least one VC, and the at least one NI;

means for obtaining a plurality of configured values, a respective one of which being associated with a respective one of the plurality of quality parameters;

means for computing a plurality of quality measures, a respective one of which being associated with the respective one of the plurality of quality parameters and the respective one of the plurality of configured values;

means for comparing the respective one of the plurality of quality measures with the respective one of the plurality of configured values to determine a plurality of differences therebetween;

means for computing a plurality of numerical grades, a respective one of which being based on a respective one of the plurality of differences; and

means for summing the plurality of numerical grades to determine a quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

72. (Original) A system as recited in Claim 71, further comprising:

means for defining a plurality of threshold ranges, a respective one of which being associated with the respective one of the plurality of quality parameters and the respective one of the plurality of configured values; and

means for comparing the respective one of the plurality of differences with the respective one of the plurality of threshold ranges.

73. (Original) A system as recited in Claim 72, wherein the means for computing the plurality of numerical grades, the respective one of which being based on the respective one of the plurality of differences comprises:

means for computing the plurality of numerical grades, the respective one of which being based on the comparison of the respective one of the plurality of differences with the respective one of the plurality of threshold ranges.

74. (Original) A system as recited in Claim 71, further comprising:

means for obtaining a plurality of weight coefficients, a respective one of which being associated with the respective one of the plurality of quality parameters; and

means for multiplying the respective one of the plurality of numerical grades by the respective one of the plurality of weight coefficients, the means for summing the plurality of numerical grades to determine the quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI being responsive to the means for multiplying the respective one of the plurality of numerical grades by the respective one of the plurality of weight coefficients.

75. (Original) A system as recited in Claim 71, wherein the plurality of weight coefficients are obtained from the client.

76. (Original) A system as recited in Claim 71, further comprising:

means for determining a qualitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI based on the quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

77. (Original) A system as recited in Claim 71, wherein the quantitative quality appraisal of the VPN is based on the quantitative quality appraisal of the at least one VC.

78. (Original) A system as recited in Claim 71, wherein the plurality of configured values are obtained from the client.

79. (Original) A system as recited in Claim 71, wherein the plurality of quality parameters are associated with an ATM quality of service class selected from the group of service classes consisting of a constant bit rate (CBR) class, a real time variable bit rate (RT-VBR) class, a non-real time variable bit rate (NRT-VBR) class, an unspecified bit rate (UBR) class, and an available bit rate (ABR) class.

91. (Previously presented) A computer program product for managing a service, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code for obtaining service quality requirements from a client;

computer readable program code for collecting quality data from a network that comprises a plurality of network elements, the computer readable program code for collecting quality data comprising:

computer readable program code for querying at least one access network element for the quality data, the at least one access network element is one of those network elements of the plurality of network elements that are configured at an edge of the network and provide access to the network;

computer readable program code for saving the quality data in a repository;

computer readable program code for analyzing the quality data; and

computer readable program code for saving the analyzed quality data in the repository; and

computer readable program code for comparing the collected quality data with the service quality requirements to determine if the service quality requirements are satisfied.

93. (Previously presented) A computer program product as recited in Claim 91, where the computer readable program code for querying the at least one access network element for the quality data comprises:

computer readable program code for querying at least one of the at least one access network element and a data collection agency for the quality data.

94. (Previously presented) A computer program product as recited in Claim 91, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the computer readable program code for analyzing the quality data comprises:

computer readable program code for computing an availability measure for at least one of the VPN, the at least one VC, and the at least one NI.

95. (Original) A computer program product as recited in Claim 94, wherein the availability measure of the VPN is based on the availability measure of the at least one VC.

96. (Original) A computer program product as recited in Claim 94, wherein the computer readable program code for analyzing the quality data further comprises:

computer readable program code for computing a mean time to restore (MTTR) measure for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for computing a mean time between service outages (MTBSO) measure for the at least one of the VPN, the at least one VC, and the at least one NI.

97. (Original) A computer program product as recited in Claim 96, wherein the MTTR measure of the VPN and the MTBSO measure of the VPN are based on the MTTR measure of the at least one VC and the MTBSO measure of the at least one VC, respectively.

98. (Original) A computer program product as recited in Claim 96, further comprising:

computer readable program code for receiving a service availability report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for sending the requested service availability report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested service availability report comprising at least one of the availability measure, the MTTR measure, and the MTSBO measure for the at least one of the VPN, the at least one VC, and the at least one NI.

99. (Original) A computer program product as recited in Claim 96, further comprising:

computer readable program code for associating an availability threshold with at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for comparing the availability measure for the at least one of the VPN, the at least one VC, and the at least one NI with the respectively associated availability threshold.

100. (Original) A computer program product as recited in Claim 99, further comprising:

computer readable program code for receiving a service availability report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for sending the requested service availability report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested service availability report comprising at least one of the availability measure, the MTTR measure, and the MTSBO measure for the at least one of the VPN, the at least one VC, and the at least one NI and a comparison of the availability measure for the at least one of the VPN, the at least one VC, and the at least one NI with the availability threshold that is associated with the at least one of the VPN, the at least one VC, and the at least one NI.

101. (Original) A computer program product as recited in Claim 92, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the

VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the computer readable program code for analyzing the quality data comprises:

computer readable program code for computing a bandwidth utilization measure for at least one of the VPN, the at least one VC, and the at least one NI.

102. (Original) A computer program product as recited in Claim 101, wherein the bandwidth utilization measure of the VPN is based on the bandwidth utilization measure of the at least one VC.

103. (Original) A computer program product as recited in Claim 101, further comprising:

computer readable program code for receiving a bandwidth utilization report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for sending the requested bandwidth utilization report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested bandwidth utilization report comprising the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI.

104. (Original) A computer program product as recited in Claim 101, further comprising:

computer readable program code for associating an over utilization threshold and an under utilization threshold with the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for comparing the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI with the respectively associated over utilization threshold and under utilization threshold.

105. (Original) A computer program product as recited in Claim 104, further comprising:

computer readable program code for receiving a bandwidth utilization report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for sending the requested bandwidth utilization report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested bandwidth utilization report comprising the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI and a comparison of the bandwidth utilization measure for the at least one of the VPN, the at least one VC, and the at least one NI with the over utilization threshold and under utilization threshold that are associated with the at least one of the VPN, the at least one VC, and the at least one NI.

106. (Previously presented) A computer program product as recited in Claim 91, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the computer readable program code for analyzing the quality data comprises:

computer readable program code for computing a delay measure for at least one of the VPN, the at least one VC, and the at least one NI.

107. (Original) A computer program product as recited in Claim 106, wherein the delay measure of the VPN is based on the delay measure of the at least one VC.

108. (Original) A computer program product as recited in Claim 106, wherein the computer readable program code for computing the delay measure for the at least one of the VPN, the at least one VC, and the at least one NI comprises:

computer readable program code for computing a cell delay variation (CDV) measure for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for computing a round trip transfer delay (RTTD) measure for the at least one of the VPN, the at least one VC, and the at least one NI.

109. (Original) A computer program product as recited in Claim 108, further comprising:

computer readable program code for receiving a delay report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for sending the requested delay report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested delay report comprising at least one of the CDV measure and the RTTD measure for the at least one of the VPN, the at least one VC, and the at least one NI.

110. (Previously presented) A computer program product as recited in Claim 91, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the computer readable program code for analyzing the quality data comprises:

computer readable program code for computing an error measure for the at least one VC.

111. (Original) A computer program product as recited in Claim 110, wherein the computer readable program code for computing the error measure for the at least one VC comprises:

computer readable program code for determining at least one of a number of lost cells, a number of misinserted cells, a number of discarded cells, a number of errored cells, and a number of cells that violate the service quality requirements from the client for the at least one VC; and

computer readable program code for computing at least one of a cell loss ratio (CLR), a cell error ratio (CER), and a severely errored cell block ratio (SECBR) for the at least one VC.

112. (Original) A computer program product as recited in Claim 111, further comprising:

computer readable program code for receiving an error report request from the client for the at least one VC; and

computer readable program code for sending the requested error report to the client for the at least one VC, the requested error report comprising at least one of the number of lost cells, the number of misinserted cells, the number of discarded cells, the number of errored cells, the number of cells that violate the service quality requirements from the client, the CLR, the CER, and the SECBR for the at least one VC.

113. (Previously presented) A computer program product as recited in Claim 91, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the computer readable program code for analyzing the quality data comprises:

computer readable program code for computing a fault measure for at least one of the VPN, the at least one VC, and the at least one NI.

114. (Original) A computer program product as recited in Claim 113, wherein the computer readable program code for computing the fault measure for the at least one of the VPN, the at least one VC, and the at least one NI comprises:

computer readable program code for determining at least one of a number of errored seconds (ES), a number of severely errored seconds (SES), and a number of unavailable seconds (UAS) for the at least one of the VPN, the at least one VC, and the at least one NI.

115. (Original) A computer program product as recited in Claim 114, further comprising:

computer readable program code for receiving a fault report request from the client for the at least one of the VPN, the at least one VC, and the at least one NI; and

computer readable program code for sending the requested fault report to the client for the at least one of the VPN, the at least one VC, and the at least one NI, the requested fault report comprising at least one of the number of errored seconds (ES), the number of severely errored seconds (SES), and the number of unavailable seconds (UAS) for the at least one of the VPN, the at least one VC, and the at least one NI.

116. (Previously presented) A computer program product as recited in Claim 91, wherein the network comprises an asynchronous transfer mode (ATM) virtual private network (VPN), the VPN comprising at least one virtual channel (VC), wherein the at least one access network element comprises at least one network interface (NI), and wherein the computer readable program code for analyzing the quality data comprises:

computer readable program code for defining a plurality of quality parameters for at least one of the VPN, the at least one VC, and the at least one NI;

computer readable program code for obtaining a plurality of configured values, a respective one of which being associated with a respective one of the plurality of quality parameters;

computer readable program code for computing a plurality of quality measures, a respective one of which being associated with the respective one of the plurality of quality parameters and the respective one of the plurality of configured values;

computer readable program code for comparing the respective one of the plurality of quality measures with the respective one of the plurality of configured values to determine a plurality of differences therebetween;

computer readable program code for computing a plurality of numerical grades, a respective one of which being based on a respective one of the plurality of differences; and

computer readable program code for summing the plurality of numerical grades to determine a quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

117. (Original) A computer program product as recited in Claim 116, further comprising:

computer readable program code for defining a plurality of threshold ranges, a respective one of which being associated with the respective one of the plurality of quality parameters and the respective one of the plurality of configured values; and

computer readable program code for comparing the respective one of the plurality of differences with the respective one of the plurality of threshold ranges.

118. (Original) A computer program product as recited in Claim 117, wherein the computer readable program code for computing the plurality of numerical grades, the respective one of which being based on the respective one of the plurality of differences comprises:

computer readable program code for computing the plurality of numerical grades, the respective one of which being based on the comparison of the respective one of the plurality of differences with the respective one of the plurality of threshold ranges.

119. (Original) A computer program product as recited in Claim 116, further comprising:

computer readable program code for obtaining a plurality of weight coefficients, a respective one of which being associated with the respective one of the plurality of quality parameters; and

computer readable program code for multiplying the respective one of the plurality of numerical grades by the respective one of the plurality of weight coefficients, the computer readable program code for summing the plurality of numerical grades to determine the quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI being responsive to the computer readable program code for multiplying the respective one of the plurality of numerical grades by the respective one of the plurality of weight coefficients.

120. (Original) A computer program product as recited in Claim 116, wherein the plurality of weight coefficients are obtained from the client.

121. (Original) A computer program product as recited in Claim 116, further comprising:

computer readable program code for determining a qualitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI based on the quantitative quality appraisal of the at least one of the VPN, the at least one VC, and the at least one NI.

122. (Original) A computer program product as recited in Claim 116, wherein the quantitative quality appraisal of the VPN is based on the quantitative quality appraisal of the at least one VC.

123. (Original) A computer program product as recited in Claim 116, wherein the plurality of configured values are obtained from the client.

124. (Original) A computer program product as recited in Claim 116, wherein the plurality of quality parameters are associated with an ATM quality of service class selected from the group of service classes consisting of a constant bit rate (CBR) class, a real time variable bit rate (RT-VBR) class, a non-real time variable bit rate (NRT-VBR) class, an unspecified bit rate (UBR) class, and an available bit rate (ABR) class.

APPENDIX B – EVIDENCE APPENDIX

None

APPENDIX C – RELATED PROCEEDINGS APPENDIX

None.